monograph of this genus.—L. Damazio (Bull. Soc. Bot. Genève II. **6**:171–172. 1914) describes and illustrates a new fern (*Elaphoglossum Beauverdii*) from central Brazil.—C. De Candolle (Bull. Soc. Bot. Genève II. **6**:107–126. 1914) describes new species in *Piper*, *Cabralea*, *Gaurea*, *Cedrela*, and *Begonia* from Paraguay. The same author (Not. Syst. **3**:38–44. 1914) has published several new species of *Piper* and *Peperomia*, including 4 from Mexico, and (Rep. Sp. Nov. **13**:304–311. 1914) describes 16 additional species in these genera from Bolivia.—L. Diels (Philipp. Jour. Sci. Bot. **8**:157–158. 1913) has published three new species of Menispermaceae from the Philippine Islands.—S. T. Dunn (Notes Roy. Bot. Gard. Edinb. **8**:153–171. 1913) in an article entitled "Notes on Chinese Labiatae" describes several species new to science and proposes a new genus, namely *Parlamium*, based on specimens collected in Yunnan by Mr. Henry.—A. Engler (Bot. Jahrb. **51**:225–471. 1914) in cooperation with several specialists has published "Beiträge zur Flora von Afrika xliii." Approximately 200 new species and varieties of flowering plants are described, and the following new genera are proposed: *Rhodohypoxis* Nel of the Amaryllidaceae, *Melliniella* Harms of the Leguminosae, *Gilgiochloa* Pilger of the Gramineae, and *Neosloetiopsis* Engler of the Moraceae.—A. W. Evans (Bull. Torr. Bot. Club **41**:577–616. *pl. 21*. 1914) under the title "Report on the Hepaticae of Alaska" includes the description of two new species of *Plagiochila* and one of *Radula* from Alaska.—J. S. Gamble (Philipp. Jour. Sci. Bot. **8**:203–206. 1913) under the title "Some additional bamboos of the Philippine Islands" records further data concerning this group of plants and adds a new species from Mindanao.—L. S. Gibbs (Jour. Linn. Soc. **42**:1–240. *pls. 1–8*. 1914) under the caption "A contribution to the flora and plant formations of Mount Kinabalu and the highlands of British North Borneo" has published an important contribution to our knowledge of the flora of Borneo. Prominent specialists have cooperated in the identification of the plants and upward of 80 species are described as new to science. The following new genera are proposed: *Phyllocrater* and *Cowiea* Wernham of the Rubiaceae, *Sigmatochilus* Rolfe of the Orchidaceae, and *Lophoschoenus* Stapf of the Crepyaceae.—J. M. Greenman.

Phenomena of parasitism.—Differences in the behavior of *Monilia cinerea* and *Botrytis cinerea* are brought out by the studies of Cooley and of Brown. These fungi represent the two sections of the genus *Sclerotinia* the members of which have frequently furnished material for investigations designed to throw light on the phenomena of parasitism. While the apothecial organs of these fungi are much alike, their conidial fructifications are widely different; but more interesting from a biological standpoint is the difference in the mode of formation of sclerotia with which the contrasting behavior brought out in the two papers can perhaps be correlated. Cooley,[3] who investigated the be-

[3] Cooley, J. S., A study of the physiological relations of *Sclerotinia cinerea* (Bon.) Schröter. Ann. Mo. Bot. Gard. **1**:291–326. 1914.

havior of *Monilia* (*Sclerotinia*) *cinerea* with reference to its parasitism, finds that the spores are incapable of infecting young green plums whose skin is uninjured, but that such fruits are easily attacked by grown mycelium applied to their surfaces. The ripening fruits, however, are readily infected through the unbroken skin by spores. The acidity of the fruit, the author finds, increases as ripening progresses. The fungous hyphae penetrate the fruit in all directions, but they do not follow the middle lamellae, nor is there a general disintegration of the host tissue due to the action of the fungus on the middle lamellae. From histological observations it appears that the host cells are not injured in advance of the penetrating hyphae. The observation that the juice of much decayed plums had no cytolytic action on the flesh of sound plums seems to be in accord with the observation on the action of the hyphae themselves, yet it can scarcely be doubted that if a sufficiently concentrated extract of the young mycelium had been prepared, more positive results would have been obtained, for, as the author himself states, it is probable that the juice was too dilute to be effective. Other objections to the use of the juice of decayed fruit are obvious. In agar tubes containing cellulose prepared from the plums by different methods, very slight action on the cellulose was observed, but filter paper cellulose was readily dissolved. In tubes containing pectin a coagulation was produced by *Monilia*, but in tubes containing suspensions of calcium pectinate without soluble carbohydrates the fungus made little growth and the pectinate was not hydrolyzed. In expressed fruit juices in which the fungus had grown, oxalic acid was found in small quantities, and also in peaches inoculated with *Monilia*, but not in others inoculated with *Penicillium* and *Aspergillus*. The fungus grows best in acid media.

BROWN[4] investigated the less strictly parasitic fungus *Botrytis cinerea*. By using large quantities of germinating spores, he was able to prepare extracts whose enzymatic activity was much greater than that of the extracts used by DEBARY, WARD, and others who investigated the cytolytic action of extracts of this or closely related species of *Botrytis*. The extracts prepared by BROWN brought about a rapid disintegration in the tissues of roots, tubers, fruits, leaves, and petals of various plants. Thin discs (1–1.25 cm.×0.5 mm.) of potato, turnip, beet, apple, etc., were disorganized in 15–90 minutes. The tissues of bryophytes and filaments of algae appear not to be affected. The process of disorganization begins with solution of the middle lamella, as a result of which the tissue loses its coherence. Finally, the cell wall itself is disintegrated and the tissue is completely disorganized. The death of the cells does not take place until some time after the cells have been separated by the solution of the middle lamella. The activity of the extract is destroyed by heat and by shaking, the toxic action being destroyed simultaneously. When the extract was dialyzed by means of collodion thimbles, the dialysate showed

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[4] BROWN, W., Studies in the physiology of parasitism. I. The action of *Botrytis cinerea*. Ann. Botany **29**:313–348. 1915.

neither cytolytic nor toxic activity, nor did it contain any trace of oxalic acid or oxalates to which the toxic action of *Botrytis* extract has sometimes been attributed. The enzyme acts only in acid media. In neutral solution its activity is greatly retarded, and in slightly alkaline media the activity is inhibited. Here again the toxic properties of the extract are affected in the same manner as the cytolytic properties. The extract may be reactivated by the addition of acid to the neutralized or alkaline medium. From the impossibility of separating, by any of the means described above, the toxic and the cytolytic properties of the extract, the author is inclined to believe that both are due to the same substance or group of substances.

The most striking difference in the physiological behavior of these two fungi is seen in the extent of their cytolytic action. By reason of its greater virulence in this respect, *Botrytis cinerea* is adapted to live as a saprophyte on dead plant tissues poor in soluble carbohydrates, while *Monilia*, possessing the power of hydrolyzing cellulose only to a slight extent, is restricted in its existence to ripening fruits and other tissues rich in soluble sugars. Correlated with this difference in the mode of life of the two fungi is the method of production of sclerotia. The tissues invaded by *Botrytis* are completely destroyed, consequently the sclerotia are formed as well defined free bodies outside of the invaded substance, while in *Monilia* the sclerotia are formed within the mummified tissues of the host, which are sometimes involved in the process.—H. HASSELBRING.

Notes on gymnosperms.—THOMAS[5] has discovered the staminate strobilus of *Williamsonia gigas* from the Jurassic of Yorkshire. The strobilus consists of 18–20 microsporophylls united into a cuplike structure. THOMAS is inclined to believe that these sporophylls were not associated with the ovule-bearing region, but that they represent an independent staminate strobilus.

SAHNI[11] has discovered in the pollen chamber of some young ovules of *Ginkgo* certain winged pollen grains which are very different from those of *Ginkgo*. About a dozen such ovules were examined, and 8 contained these foreign pollen grains, characterized by prominent wings. Furthermore, not only did these ovules contain foreign pollen from as many as three distinct species, but one of the pollen grains was in an advanced stage of germination. The interesting suggestion is made that if a similar example were found in a fossil, "it would in all probability lead to a reference of the pollen grains and ovules to the same species." Since this has been done already, the caution is well taken.

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[5] THOMAS, H. HAMSHAW, On some new and rare Jurassic plants from Yorkshire: the male flower of *Williamsonia gigas* (Lind. and Hutt.). Proc. Cambridge Phil. Soc. **18**:105–110. *pl. 6. figs. 2.* 1915.

[6] SAHNI, BIRBAL, Foreign pollen in the ovules of *Ginkgo* and of fossil plants. New Phytol. **14**:149–151. *pl. 2.* 1915.